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A REVISION OF THE NORTH AMERICAN MELICÆ.

BY F. LAMSON SCRIBNER.

The determination of our North American species of the genus *Melica*, and the notes relative to their distribution, etc., contained in the present paper, are based upon the collections in the herbarium at Cambridge, the Torrey herbarium, and the herbarium of the Department of Agriculture at Washington, all of which have been kindly loaned me for this purpose, by those having them in charge. I have also consulted the herbarium of the Academy of Natural Sciences of Philadelphia, as well as several valuable private collections.

The following is a synopsis or analytical key of the species, as they appear to me, by which it is hoped they may be readily identified without the aid of more extended descriptions.

§ 1. GLYCERIÆ.

Spikelets 1-5 flowered, flowering glumes herbaceo-coriaceous, with a narrow scarious margin above, strongly 7-nerved.

Culms not bulbiferous, panicle many-flowered, spikelets $1\frac{1}{2}$ - $2\frac{1}{2}$ lin. long, with 1, or sometimes 2 perfect flowers.

Empty glumes shorter than the spikelet, rudimentary floret large, and nearly sessile. *M. imperfecta*. 1.

Empty glumes as long as the floret, the second one exceeding it, rudimentary floret small, long stipitate.

M. Torreyana. 2.

Culms bulbiferous, panicle simple, few-flowered with short divergent branches, spikelets 4-7 lin. long, with 3-5 perfect florets, flowering glumes 2-3 lin. long, joints of the thickened rhachilla about 1 lin. long. *M. fugax*. 3.

§ 2. EUMELICA.

Spikelets 4-8 lin. long, with 2-8 perfect florets, flowering glume apparently many-nerved below (at least when dry), with a broad scarious margin above.

Culms not bulbiferous.

Empty glumes very unequal and decidedly shorter than the 3-5 flowered spikelets.

Panicle diffusely branched, many-flowered, the flexuose pedicels smooth or slightly pubescent. *M. diffusa*. 4.

Panicle narrow, the slender branches erect, or the lower slightly divergent, pedicels flexuose or recurved, densely pubescent. *M. Porteri*. 5.

Empty glumes unequal, the second nearly or quite as long (6–8 lin.) as the 4–6-flowered spikelets.

Panicle with 6–15 large, pendulous spikelets forming a simple secund raceme. *M. stricta*. 6.

Panicle strict, densely many-flowered above, interrupted below, branches and short, straight pedicels erect.

M. frutescens.¹ 7.

Empty glumes subequal, nearly as long (4–5 lin.) as the 2-flowered spikelets.

Panicle few-flowered, sparingly branched below, often reduced to a simple raceme. *M. mutica*. 8.

Culms bulbous at base (excepting in occasional samples of No. 10).

The second glume decidedly shorter than the third.

Panicle nodding, loosely few-flowered, the slender branches erect spreading, flowering glume very broadly acuminate, obtuse or notched at the tip, terminal floret acute.

M. spectabile. 9.

The second glume as long as the third.

Panicle erect, densely many-flowered, branched below, spicate above, spikelets about 4 lin. long, with about 3 perfect florets the rudimentary one obtuse. *M. Californica*. 10.

Panicle erect, branches appressed, few-flowered, spikelets 5–6 lin. long, with 5–8 perfect flowers, terminal floret acute.

M. bulbosa. 11.

§ 3. BROMELICA.

Spikelets of 3–8 perfect florets, the lower exceeding the empty glumes; lower palea prominently 7-nerved, apiculate or distinctly awned by the excurrent midnerve at the notched or bifid or narrowly truncate or rarely long attenuated tip (Thurber).

Culms bulbiferous, panicle with spreading, very unequal few-flowered rays, the upper rays and spikelets mostly solitary.

Flowering glumes smooth or minutely scabrous, notched at the acute tip, the midnerve ending as a short point or awn between the teeth.

M. bromoides. 12.

¹ *Melica frutescens* approaches, by intermediate forms, very closely to *M. Californica*, but the membranous character of its glumes, the unusual length of the outer ones, and the comparatively short palea (this being scarcely half as long as its glume) suggest a nearer relationship with *M. stricta*.

Flowering glumes ciliate on the margin and hirsute, especially below, with scattered hairs, long attenuated into a narrow subulate point, but not awned. *M. subulata*. 13.

Culms not bulbous at the base, panicle contracted.

Flowering glume about 4 lin. long, ciliate on the margin below with long shining hairs, apex truncate or obtusely lobed, awn when present not exceeding 3 lin. in length.

M. Harfordii. 14.

Flowering glume 5-6 lin. long, strongly scabrous, with a few stiff marginal hairs near the base, awn 4-7 lin. long.

M. aristata. 15.

1. *Melica imperfecta*, Trin. in Mem. Acad. St. Petersb., 1840, 59, and Icon. Gram., t. 355; Bolander, Proc. Calif. Acad., 1870, iv, 101; Thurber in S. Wats. Bot. Calif., ii, 303. *M. colpodoides*, Nees. in Tayl. Mag. Nat. Hist., 1, 282; *M. panicoides* and *M. poæoides*, Nutt. in Pl. Gamb., 188.

HAB.—*California*: Hills, San Bernardino Valley, Parish Bros., No. 885, April, 1881; San. Bernardino Co., Parry and Lemmon, No. 403, 1876; G. R. Vasey, No. 664, 1880; Southern California, Parry and Lemmon, No. 404; Santa Maria, Sta. Barbara Co., Lorenzo Jared, 1881; Santa Barbara, Mrs. E. Cooper, 1879; "Abundant in dry rock places," Mrs. R. F. Bingham, 1882; Fall Brook, M. E. Jones, No. 3092, March, 1882 (spikelets $2\frac{1}{2}$ lin. long); Guadaloupe Island, off Lower Calif., E. Palmer, No. 98, 1875; Los Angeles, Bolander, Kellogg & Co. (a form with unusually broad and obtuse outer glumes). Two-flowered forms, the *M. poæoides* of Nuttall, come from San Francisco, Bolander, No. 6076, in part; Hills, San Diego, C. G. Pringle, 1882; Miss Scott, 1880; Dr. Cleveland, 1882.

Var. *refracta*, Thurber in S. Wats. Bot. Calif., ii, 303.

HAB.—Near San Bernardino, Calif. J. G. Lemmon, No. 1471, 1879.

Var. *flexuosa*, Bolander, Proc. Calif. Acad., iv, 101; Thurber, l. c., 303.

On the road from Mariposa to Clarks, Bolander; Santa Inez Mission, Brewer, No. 569 (teste Thurber).

I do not recognize this variety among the specimens I have in hand.

Var. *minor*.

Characterized by its comparatively low and densely tufted habit, short and chiefly radical leaves, compressed or angular culms, slender few-flowered panicle, the short branches divergent or even reflexed; the spikelets are generally smaller than in the species and the outer glumes usually shorter and more obtuse.

HAB.—San Bernardino Mts., Parish Bro., No. 856, May, 1882.

2. *Melica Torreyana*. *M. imperfecta*, var. *sesquiflora*, Torrey in Herb.

The specimens thus ticketed by Dr. Torrey were collected in California, by Dr. Bigelow, in 1853-4.

This proposed new species is distinguished from *M. imperfecta*, with which it is very closely allied, by its more membranaceous, longer and more acute glumes—the second one equaling or exceeding the floret—by the hairs on the back of the flowering glume above the middle and by the *long-pedicelled* rudimentary floret, characters which seem to me to be of specific value.

Bigelow's specimens are immature, but the typical form is well represented by the specimens distributed by Bolander, Kellogg & Co. (1872). In these specimens the culms are 3 ft. high or more, leaves numerous, flat, 2-3 lin. wide, 6-8 in. long; ligule 3-4 lin. long, lacerated; panicle 6-10 in. long, diffuse, the slender flexuose branches 2-4 in. long and few-flowered at the ends, naked below. The characters of the spikelets are well shown in fig. 3, Pl. I.

Forms with two-flowered spikelets occur, but the second floret and rudiment are long-pedicelled, while in similar two-flowered forms of *M. imperfecta*, these are both nearly sessile.

No. 13 Bolander. and No. 6076 Bolander in part belong to this species. No. 586, collected by Dr. Torrey at New Almaden, California, in 1865, is a narrow-panicled form of *M. Torreyana*, closely resembling *M. imperfecta*, but at once recognized by the characters above noted.

3. *Melica fugax*,¹ Bolander, Proc. Calif. Acad., iv, 104; Thurber in S. Wats. Bot. Calif., ii, 304. *M. Geyeri*, Thurber, Bot. Wilkes' Exped., 492, not Munro.

HAB.—*California*: J. G. Lemmon, 1875; Sierra Valley, J. G. L., 1873 and 1874; Donner Lake, Bolander, Kellogg & Co., 1872; Plumas Co., Mrs. Austin, 1877. *Oregon*: Dry mountain sides, Union Co., W. C. Cusick, No. 1032, June, 1882. *Washington Territory*: Open pine woods, Falcon Valley, W. N. Suksdorf, Nos. 61 and 16, 1883.

In the spikelets of *Melica fugax*, the rhachilla is smooth, thickened and of a peculiar spongy texture, quite unlike that of any other North American species.

¹ The *Melica*, from Mt. Shasta, referred to in my List of Pringle's Grasses (see Torr. Bull., x, p. 31, No. 72), is not *M. fugax*, nor am I able to identify it with any of the known species, unless it be an unusual form of *M. bulbosa*, Geyer. The specimens in hand are too meagre for more definite conclusions.

4. *Melica diffusa*, Pursh Flor., i, 77; Kunth En. Pl. i, 377; Stendel Gram., 291: *M. altissima*, Walt, Flor. Carol., 78. *M. glabra*, Michx., i, 62 (in part). *M. mutica*, var. *diffusa*, Gray in Man., 626. *M. scabra*, Nutt., Fl. Ark., 148.

Var. *nitens*.—*M. nitens*, Nutt. in Herb. Phila. Acad. *M. mutica*, Torr. in Marcy's Rept.

Differs from the species in its more leafy culms, narrower leaves, more densely flowered panicle, and in its much broader and more unequal outer glumes, the second one being nearly as long as the spikelet.

DISTRIBUTION.—Pennsylvania, Illinois, southward and westward to Texas. The variety = No. 3464 a, Curtiss' Distribution N. Am. Plants, coll. in Texas by J. Reverchon; also 389, Lindheimer, and 2062, C. Wright. Nos. 729, Lindheimer (1847), and 769, C. Wright (1849), belong to the species.

5. *Melica Porteri*, Scribner in Rusby's Arizona plants, No. 881½, 1883, and in Pringle's distribution of 1884. *M. mutica*, var. *parviflora*, T. C. Porter in Porter & Coulter's Fl. of Colorado, 149; *M. stricta*, Brandegee, Fl. Southwestern Colorado, p. 244.

HAB.—*Colorado*: Glen Eyrie, near Colorado City, T. C. Porter, July, 1872, and August, 1873. "This *Melica*, which I have from several stations in Colorado, I am now inclined to think a good species, as you do." T. C. P. in litt., December, 1882; Chiann Cañon, M. E. Jones, No. 1550, June, 1879; Cañon of the Rio La Plata, and Parrott City (alt., 8500 ft.), T. S. Brandegee; Hall and Harbour, No. 228. *Arizona*: Rusby, 1883; Santa Rita Mts., Pringle, 1884; Sierra Blanca, J. T. Rothrock, No. 805, 1874; J. G. Lemmon, 1884 (specimens differing from the type in their smaller spikelets, scarcely exceeding 4 lin. in length, while in the ordinary forms they are two lines longer). *New Mexico*: C. Wright, No. 2063, 1851, and Fendler, No. 924, 1847; G. R. Vasey, No. 142, July, 1881. *Texas*: Chixos Mts., V. Havard, No. 19, 1883 (a small flowered form like that collected by Lemmon in Arizona).

6. *Melica stricta*, Bolander, Proc. Cal. Acad., iii, 1863, p. 4, and iv, p. 104; Watson, Bot. King's Exped., 384; Thurb. in S. Wats. Bot. Cal., ii, 303.

HAB.—*California*: Virginia City, Bolander, No. 47; Yosemite Valley. Bolander, No. 6089, 1866; Sierra Co., J. G. Lemmon, No. 223, 1874; Bolander, Kellogg & Co., 1872 (alt. 7000 ft.); Sierra Nevada, "crevices of high rocks, 9000 ft.," E. L. Greene, No. 417, Oct., 1884; same district, alt. 9500 ft., C. G. Pringle, Sept., 1882; Plumas Co., R. M. Austin, 1878; Soda Springs, alt. 9000 ft., M. E. Jones, July, 1881; "Dry ridges, among rocks," Bear Valley, San Bernardino Mts., Parish Bros., No. 1553, Aug., 1882. *Nevada*: East Humboldt Mts., alt. 8000 ft., Aug., and Pah Ute Mts., alt. 5500 ft., June, S. Watson, No. 1305, 1868.

Note.—The inflorescence of this alpine species is similar to that of *M. Porteri*, but the panicle is much shorter, with only about a dozen spikelets, rarely more than 20, and the spikelets themselves are very much larger.

7. *Melica frutescens*.

Culms $2\frac{1}{2}$ – $3\frac{1}{2}$ feet high, simple or branched near the base, leafy; leaves narrow, involute near the tip, scabrous, as are also the sheaths. Panicle 6–12 inches long, strict, densely flowered and spicate above, interrupted below, the appressed branches 1–3 inches long, densely flowered, or the longer ones naked below. Spikelets about 6 lin. long, with usually 5 perfect florets; first glume about 5 lin. long; the second a line longer, nearly equaling the spikelet; third glume about 4 lin. long, obtuse, the papery-membraneous tip occupying fully a third of its length. Palea usually about one-half the length of its glume.

HAB.—*California*: Southern California, Parry and Lemmon, No. 401, 1876; Mountains San Diego Co., C. G. Pringle, April 20, 1882; Lower California, near the United States border, C. R. Orcutt, No. 513, May, 1883; Near the Tia Juana, M. E. Jones, No. 3748, April 6, 1882.

8. *Melica nutica*, Walt., Flor. Carol., 78 (1788). *M. glabra*, Pursh.; Mx. (in part.), *M. nutica*, var. *glabra*, Gray in Man., 626. *M. speciosa*, Muhl., Ind. Fl. Lanc. (1791), 161, and Gram., i, 87. *M. racemosa*, Muhl. Gram., 88. *M. Muehlenbergiana*, Schult, Mant., 2, 294 (after Kunth).

DISTRIBUTION.—Pennsylvania, southward and westward to Texas, (781, E. Hall).

Distinguished from *M. diffusa*, with which it has been united by some authors, by its more slender habit, less branched and fewer flowered panicle, which is often reduced to a simple raceme. The spikelets also rarely have more than two perfect florets, the outer glumes are more nearly equal in length, and often quite as long as the spikelet, while the flowering glumes are broader and more obtuse.

9. *Melica spectabile*. *M. bulbosa*, S. Wats., Bot. King. Exp., 383; Porter & Coulter, Fl. Colorado, 149.

HAB.—*Montana*: Crow Creek Mts., etc., alt. 6000 ft., Scribner, No. 385, 1883; Bozeman Pass, Wm. M. Canby, No. 368, 1883. *Colorado*: Twin Lakes, Upper Arkansas, and Plains near Ogden, T. C. Porter, 1872. Yellowstone Park, C. C. Parry, No. 295, 1873. *Utah*: Cottonwood Cañon, alt. 10,000 ft., S. Watson, No. 1303, July, 1869. *Idaho*: Beaver Cañon, S. Watson, No. 455, July, 1880.

This grass has been referred to Geyer's *M. bulbosa* by authors, but aside from its affecting higher elevations, it is readily distinguished from that species by its usually taller and more slender culms, by its more open and nodding panicle, by the more

slender and flexuose pedicels, by its shorter empty glumes, and by its broader flowering glumes, which taper abruptly to a rounded and usually two-lobed summit.

10. *Melica Californica*, *M. poaeoides*, Torrey, in Pac. R. Rep., iv, 157, non Nutt. *M. bulbosa*, Thurber, in S. Wats. Bot. Calif., ii, p. 304, non Geyer.

HAB.—*California*: Bolander, Nos. 32 and 6120; Kellogg & Harford, No. 1133, 1868-9; San Bernardino, Parish Bro., No. 865, 1881.—Mud Springs, Upper Yellowstone, T. C. Porter, 1871.

The bulbous character of the base of the culm, although usually manifest, is sometimes wholly wanting, as in Prof. Porter's specimens from the Upper Yellowstone.

Prof. Thurber's description in the Botany of California applies only to the Californian plant (*M. Californica*); from the distribution given, however, and the authors cited, it is evident that he supposed this to be identical with Geyer's plant, which is typically represented by Cusick's specimens, and also my *M. spectabile*. I have endeavored to point out the characters that distinguish these three species, which, to me, appear sufficiently well marked to leave little doubt of their specific rank.

11. *Melica bulbosa*, Geyer, in Hook. Jour. Bot., viii, 1856, 19 (without description); Gray, Proc. Am. Acad., viii, 409.

Culms bulbous at the base, growing singly or densely tufted, usually about 2 ft. high, simple; sheaths and upper surface of the leaves scabrous or (in Howell's specimens) retosely pubescent; panicle slender erect, the short 1-3 flowered branches appressed; spikelets 5-7 lin. long with 6-8 perfect florets; empty glumes obtuse, the first about 3 lin. long, the second a line longer and nearly equaling the third or first flowering glume, which is oblong lanceolate, obtuse or notched at the tip and generally larger and firmer in texture than in *M. Californica*.

HAB.—*Oregon*: "Rocky ravine, Upper Platte, and only seen in one grassy spot," Geyer, No. 11; Union Co., W. C. Cusick, No. 900, 1880 and 900 a, 1882; Bolander, Kellogg & Co., 1872; Henderson, 1882; E. Hall, No. 635, 1871; Howell, 1881. *Washington Territory*: T. S. Brandegee, No. 1182, 1883. *Nevada*: Wheeler, 1872; West Humboldt Mts., alt. 8500 ft., S. Watson, No. 1304, 1867. *Idaho*: Bois City, Dr. J. E. Wilcox, 1883. *Utah*: Wasatch Mts., alt. 9000 ft., M. E. Jones, 1879; Ogden, J. M. Coulter, 1872. *Montana*: Belt Mts., alt. 6000 ft., Scribner, No. 386, 1883 (spikelets crowded above, 7-8 lin. long and 5-7 flowered).

12. *Melica bromoides*, Gray, Proc. Am. Acad., viii, 409; Thurber in S. Wat. Bot. Cal., ii, 304. *M. Geyeri*, Munro, ex Bolander, Proc. Cal. Acad., iv, 130. *M. poeoides* and *M. p.* var. *bromoides*, Nos. 6120, 40 and 6119 of Bolander's distributed sets. *Glyceria bulbosa*, Buckley, Proc. Phila. Acad., 1862, 95!

HAB.—*California*: Redwoods, Coast Range, Mt. Dana, Bolander, No. 6119; San Francisco, No. 6120; Woods, Ukiah, Mendocino Co., Bolander, No. 40. *Oregon*: Near Waldo, Thos. Howell.

Note.—Mr. Howell sends from Oregon (No. 335, 1884) a form that differs from the type in its more open and fewer-flowered panicle; the flowering glumes are also considerably longer, and entire, or but slightly notched at the tip, without any awn. This form has a decided festucoid "look," and may be designated as var. *Howellii*.

13. *Melica subulata*. *Bromus subulatus*, Griseb. in Ledeb. Fl. Ross., iv, 358; Gray, Proc. Am. Acad., viii, 410. *M. acuminata*, Bol., Proc. Cal. Acad., iv, 104; Thurber in S. Wats. Bot. Cal., ii, 305. *M. poeoides*, var. *acuminata*, of Bolander's distribution, No. 4698.

HAB.—*California*: Mendocino Co., Bolander, 1866. *Oregon*: E. Hall, No. 645, 1871; "Low mountains," Union Co., W. C. Cusick, No. 876, 1880; "Along mountain streams," Howell, 1880, distributed sub nom. "*M. Geyeri*"; Kellogg and Harford, No. 1112, 1868-9; Suavie's Island, Howell, 1883. *Washington Terr.*: Woods, Columbia River, W. N. Suksdorf, 1882; G. R. Vasey, No. 129, 1883.

Festuca subulata, Brong., is cited as a synonym for this species by Dr. Gray and Prof. Thurber. The description, in Led. Fl. Ross., of *F. subulata*, Brong., and the synonyms there quoted point to a very different grass. I would rather concur with the opinion expressed by Prof. E. Hackel, that *F. pauciflora*, Thurber, in S. Wats. Bot. Cal., ii, 318 (No. 6073, Bolander), is the *F. subulata*, of Brongard, and not Thunberg's *F. pauciflora*.

14. *Melica Harfordii*, Boland. in Proc. Calif. Acad., iv, 102; Thurber in S. Wats. Bot. Calif., ii, 305.

HAB.—*California*: Cañons, Santa Cruz Coast, Bolander, and Redwood on the Upper Mattole River, No. 6424: Sierra, alt. 4000 ft., Bolander, Kellogg & Co., 1872; G. R. Vasey, 1875 (these specimens show well the tufted habit of the species); J. G. Lemmon. *Oregon*: Waldo, Howell, June, 1884; L. F. Henderson, 1883. *Washington Territory*: Willamette Slough, Howell, May, 1882; Dry rocky hillsides, Columbia River, Klickitat Co., W. N. Suksdorf, 1882.

"This grass I collected in June, 1864, in a gulch near the summit of Santa Cruz Mts. It grows in large tufts 3-6 ft. high, the spikelets breaking asunder, even in what appear to be young specimens, at the slightest touch. Panicle contracted, erect,

slightly drooping at the apex, caused by the club-shaped heavy top, often 9 in. long, with a few or even a single branch far below the main panicle. This spring I noticed the same grass near Ukiah."—*Bolander in Herb. A. Gray.*

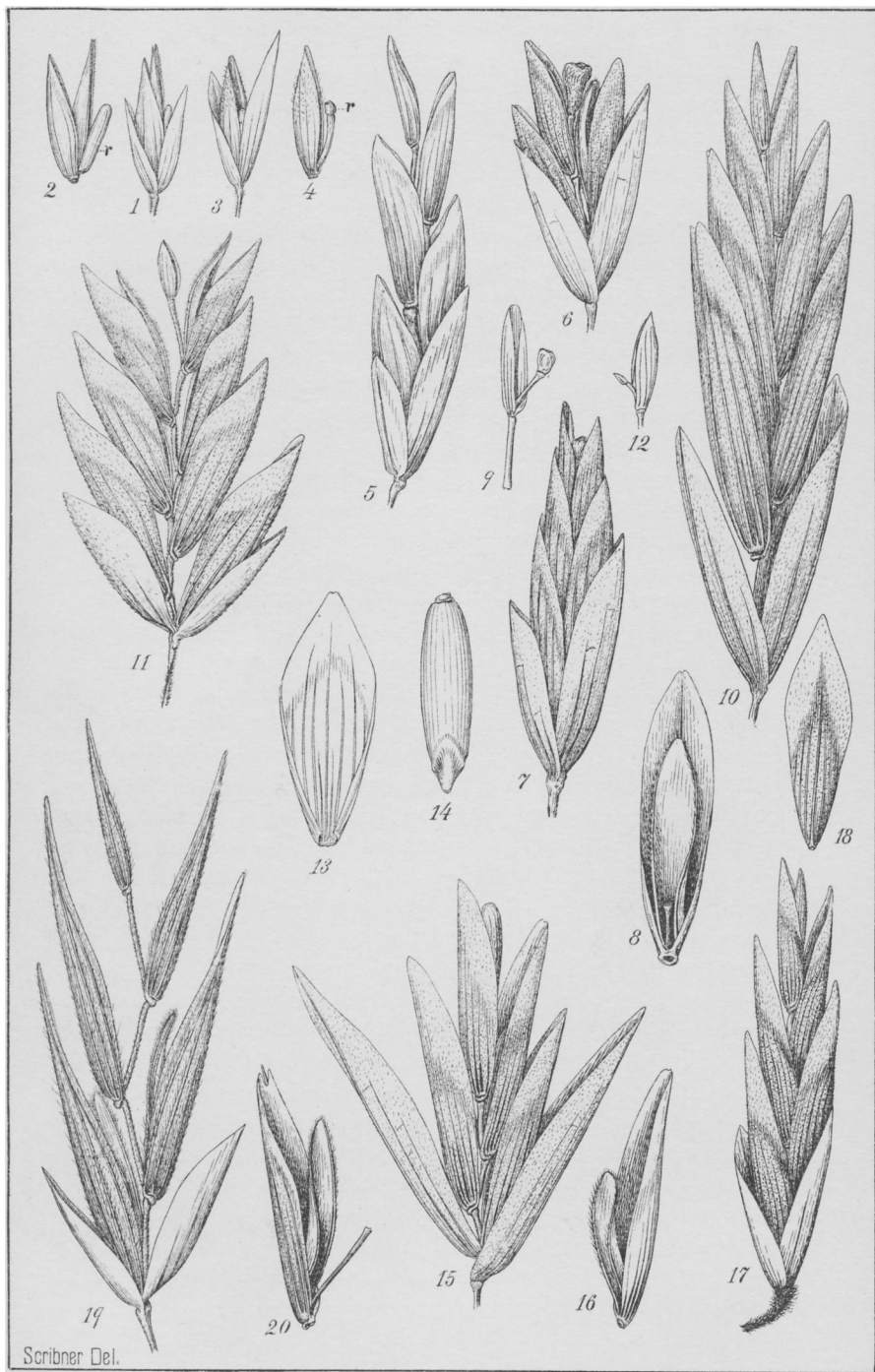
In Bolander's specimens the spikelets are about 5 lin. long, and less than a line in width; the second empty glume is scarcely 3 lin. long, and the slender awn of the flowering glume is about a line in length. In the Oregon specimens the spikelets are 8 lin. long and nearly 2 lin. in width, with the second glume nearly 5 lin. long.

15. *Melica aristata*, Thurb. in Bolander's Revision of the *Meliceæ*, Proc. Calif. Acad., iv, 103, and in S. Wats. Bot. Calif., ii, p. 305.

HAB.—*California*: Yosemite Valley, Bolander, No. 4861, 1866 (sheaths and leaves densely pilose); Bolander, Kellogg & Co., 1872 (culms stout, 3 ft. high, panicle a foot long, purplish); Emigrant Gap, M. E. Jones, 1882; Mt. Shaster, alt. 6000 ft.; C. G. Pringle, August, 1881 (culms slender, smooth, sheaths and leaves scabrous, panicle simple, few-flowered, dark purple). *Washington Territory*: W. N. Suksdorf, 1883 (panicle few-flowered, green.)

EXPLANATION OF PLATE I.

- FIG. 1. Spikelet of *Melica imperfecta*.
 " 2. Same with the outer glumes removed, showing the nearly sessile rudimentary floret, *r*.
 " 3. Spikelet of *M. Torreyana*.
 " 4. Same with outer glumes removed.
 " 5. Spikelet of *M. fugax*.
 " 6. Spikelet of *M. Californica*.
 " 7. Spikelet of *M. bulbosa*, from the typical plant.
 " 8. Anterior view of floret of same, showing palea.
 " 9. Terminal empty glume and rudiment of same.
 " 10. Spikelet of *M. bulbosa*, the florets raised above the empty glumes; unusually large, from the Idaho specimens.
 " 11. Spikelet of *Melica spectabile*.
 " 12. Terminal empty glume and rudiment of same.
 " 13. Anterior view of flowering glume of same, flattened to show veins, etc.
 " 14. Seed of *M. bulbosa* from Howell's specimens.
 " 15. Spikelet of *Melica frutescens*.
 " 16. Floret of same.
 " 17. Spikelet of *Melica Porteri*.
 " 18. Dorsal view of flowering glume, flattened out above.
 " 19. Spikelet of *Melica subulata*.
 " 20. A floret from the spikelet of *Melica bromoides*.
 All enlarged on the same scale, excepting fig. 14.



SCRIBNER ON MELICAE.